generically by some zoologists. The skeleton has not been described. Perhaps *D. borealis*, Peale, from the North Pacific, also without dorsal fin, and of which only the external characters are known, may be allied to it.

Steno, Gray, Zool. Erebus & Terror, p. 43 (1846).

Rostrum long, narrow, and compressed, very distinct from the cranium. Symphysis of the mandible as long as or longer than one fourth the length of the ramus. Teeth $\frac{21}{21}$ to $\frac{25}{25}$, of comparatively large size (5–6 millim. in diameter); surface of their crowns finely furrowed. Vertebræ: C. 7, D. 12, L. 15, C. 32; total 66.

S. rostratus (Cuvier), with the closely allied, if not identical, *S. compressus*, Gray, *S. reinwardtii* (Schlegel), and *S. perspicillatus* (Peters).

b. Pterygoid bones narrow, not uniting in the middle line; their inner borders not parallel, but diverging posteriorly.

Sotalia, Gray, Cat. Seals & Whales Brit. Mus. 2nd ed. p. 393 (1866).

Cranial characters, except as regards the form of the pterygoid bones, much as in *Steno*. Teeth tolerably large (4–5 millim. in diameter), $\frac{30}{30}$ to $\frac{35}{35}$, with smooth enamelled surface. Vertebræ: C. 7, D. 12, L. 10–14, C. 22; total 51–55. Pectoral fin broad at the base, the breadth being caused by the considerable development and position of the two outer digits.

S. guianensis, Van Beneden, with the closely allied *S. brasiliensis*, Ed. Van Beneden.

S. pallida, Gervais. *S. tucuxi*, Gray.

S. sinensis (F. Cuvier).

S. plumbeus (Dussumier).

S. gadamu (Owen).

S. lentiginosus (Owen).

2. On a Specimen of Rudolphi's Rorqual (*Balænoptera borealis*, Lesson), lately taken on the Essex Coast. By William Henry Flower, LL.D., F.R.S., P.Z.S., &c.

[Received November 19, 1883.]

Early in the morning of the 1st of the present month some fishermen discovered a Whale alive in shallow water near the mouth of the River Crouch, in Essex. After considerable difficulty they succeeded in capturing and killing it. It was exhibited for some time at Southend, and was the subject of a Chancery suit regarding its ownership between the Lord of the Manor of Burnham, Sir Henry Mildmay, and the fishermen who caught it, which resulted in the former establishing his claim to it as a "royal fish."

Mr. J. T. Carrington, who saw it within two days of its capture, describes the colour of its back as a rich glossy black, which shaded to a brilliant white on the underparts, the flippers being black. The animal was a male.

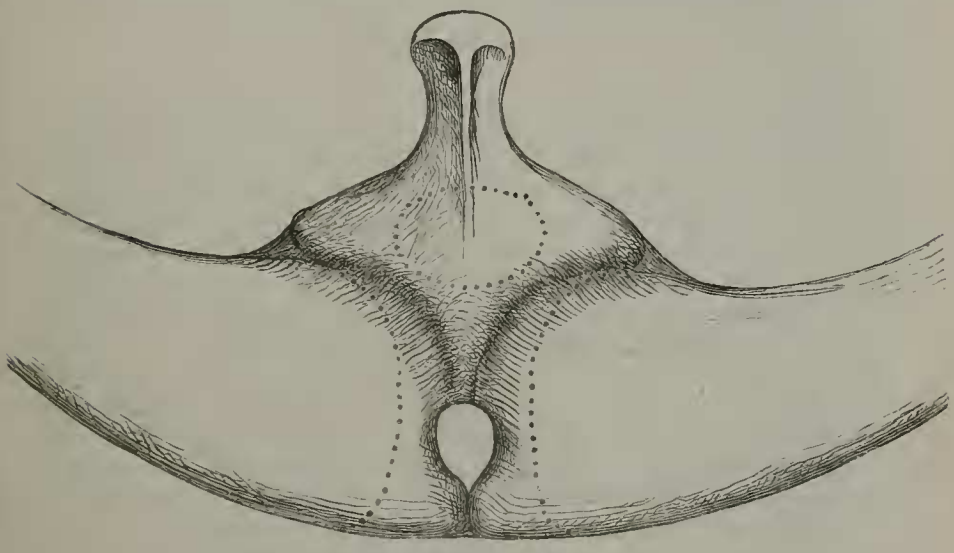
When roughly cleaned, under Mr. Gerrard's superintendence, the bones and some other parts were removed to the prosector's room in the Society's gardens, where I had an opportunity of examining them on the 17th. It then became perfectly evident that the animal was a characteristic specimen of the species named above, apparently not quite adult.

The skull measured 6 feet 2 inches (1·880 m.) in length, and the complete vertebral column 22 feet 3 inches (6·780 m.), giving 28 feet 5 inches (8·660 m.) from the apex of the rostrum to the end of the last caudal vertebra in a straight line, all the intervertebral substances being preserved. The length of the animal in the flesh may therefore be taken at about 29 feet (8·840 m.). The numbers of the vertebræ of the different regions of the column were: cervical 7, dorsal 13, lumbar 15, and caudal 21; or 56 in all. The upper end of the first rib of both sides was deeply cleft into two distinct heads[1], the posterior of which was directly articulated to the end of the transverse process of the first dorsal vertebra; the anterior was connected by a considerable mass of ligamentous substance to the approximated terminations of the upper and lower transverse processes of the posterior cervical vertebræ. It may therefore be regarded as a cervical rib, the distal end of which has coalesced with the first thoracic rib, a condition well illustrated by the specimen in the Brussels Museum, described by me in the 'Proceedings' of the Zoological Society, 1864, p. 417, where, on the right side, it is still free[2]. The thirteenth rib had a very small head, and was not directly attached to the transverse process of the corresponding dorsal vertebra, which showed no appreciable articular expansion at its extremity as in all the preceding ribs. The sternum was small and mainly cartilaginous; its length is but 7 inches, and its greatest breadth not quite so much. Its form and mode of attachment to the broad ends of the first pair of ribs are shown in the annexed figure (p. 515) from a sketch made while they were still in connexion. The ossified portion was a broad lozenge-shaped or oval nucleus, which is all that remains in the hitherto described skeletons of immature individuals, and gives very little idea of the real form of this part of the skeleton. In perfectly adult animals the whole would probably ossify, and give a shape of sternum like that of *Balænoptera rostrata*, but with a shorter posterior limb to the cross. The chevron bones were twelve in number. The stylo-hyals had the

[1] As in all the specimens of this species hitherto described, except that recorded by Turner (Journ. Anat. & Physiol. April 1882).

[2] As an additional illustration to the numerous cases already recorded of the presence of cervical ribs in the Cetacea, I may mention that in a specimen of *Tursiops tursio*, prepared during the present year for the Museum of the Royal College of Surgeons, there is a pair of such ribs, each 52 millim. in length, articulated to the extremities of the transverse processes of the seventh cervical vertebra.

broad flattened form characteristic of this species. The pelvic bones were very small and partly cartilaginous, $4\frac{1}{2}$ inches long, flattened, with one border slightly concave, and the other convex, and having a rounded prominence near the middle. The pectoral fins were long and narrow, as in the Rorquals generally; the length from the head of the humerus to the extremity of the fin was 3 feet 9 inches (1·140 m.), the greatest breadth 9 inches (0·230 m.). The skin not having yet been removed, I can give no information about the number or form of the carpal bones or phalanges. The dorsal fin was preserved with the skeleton, and appeared large in proportion to the size of the animal, at all events in comparison with that of *B. musculus*. Its extremity is pointed, and its hinder border strongly



Balænoptera borealis.

Sternum and sternal ends of first pair of ribs in their natural relations; one fourth natural size. The dotted lines show approximatively the extent of ossification of the sternum and of the ribs.

concave, giving it a distinctly falcate form; its height above the general line of the back is 11 inches (0·280 m.), and the length of its base 1 foot 4 inches (0·406 m.).

The baleen was also fortunately preserved. The outer edge and greater part of each blade is black; but the inner edge and the hairy fringe of the larger blades and the small or subsidiary inner blades are almost pure white. The small blades at the posterior end of the series gradually change in colour from black to nearly white. The longest blades in the middle of the series are exactly 12 inches in length on the outer edge, to which about an inch may be added for the hairy fringe. To count the blades accurately is impossible, as they gradually degenerate at the extremities of the series, especially in front, into little more than bristles; but 300 on each side may be taken as a close approximation.

The osteological characters of this species of Rorqual are well known, from the description by Rudolphi[1] of a specimen stranded in 1819 on the coast of Holstein, the skeleton of which is still preserved in the Berlin Anatomical Museum; from the description which I gave in the 'Proceedings' of this Society for 1864 of two skeletons, one in the Leiden and the other in the Brussels Museum; and from the subsequent figures and descriptions of the same specimens published in the great work on the Osteography of the Cetacea by Van Beneden and Gervais. More recently P. Fischer has given some notes upon a young individual, stranded July 29th, 1874, between Bidart and Biarritz (Basses-Pyrénées), the skeleton of which is preserved in the Museum of Bayonne[2]; and Professor Turner has described an older one (about 38 feet long) which was captured near Bo'ness, in the Firth of Forth, in September 1872[3], the skeleton of which is now in the Anatomical Museum of the University of Edinburgh.

This is certainly the least common of the four species of Rorquals known to inhabit the North Atlantic, and the one of the occurrence of which in British waters there are fewest records. In fact, except the one just mentioned as described by Professor Turner, there is no other well-authenticated case; although it is possible that the Whale stranded at Charmouth, in Dorset, in 1840, described by Sweeting (P. Z. S. 1840, p. 11)[4], was one. Unfortunately none of its bones were preserved to authenticate its specific characters; and it might have been a young individual of one of the larger species, *B. musculus* or *B. sibbaldii*.

There has been considerable confusion about the nomenclature of this species, as of most other Whales.

The first specimen which came distinctly under the notice of any zoologist was that mentioned above, carefully described by Rudolphi, who, however, erroneously identified it with *B. rostrata* of Fabricius and Hunter, a distinct and well-known species. The skeleton was afterwards described under the name of "Rorqual du Nord" by Cuvier[5], who compared and contrasted it with the "Rorqual de la Méditerranée," which is now known as *B. musculus*. Lesson, in 1828[6], translated Cuvier's name into Latin, calling it *Balænoptera borealis*, but including under the same designation another specimen now known to belong to a different species; but still Rudolphi's Whale was the type. Fischer[7] also uses the same name for a number of Whales of several species, including Rudolphi's, which is placed second on the list, the first being an example of *B. rostrata*, miscalled by Albers *B. boops*.

[1] Abhandl. der königl. Akad. zu Berlin, 1820, p. 27.

[2] "Cétacés du Sud-ouest de la France," Actes de la Société Linnéenne de Bordeaux, t. xxxv. 1881, p. 81; also 'Comptes Rendus,' t. lxxxiii. p. 1298, Dec. 27, 1876, and 'Journal de Zoologie.' v. p. 462, 1876.

[3] Journ. Anatomy and Physiology, April 1882, p. 471.

[4] See also Mag. Nat. Hist. 1840, p. 342. and Ann. & Mag. Nat. Hist. vi. p. 72, Sept. 1841.

[5] 'Ossemens Fossiles,' v. p. 564 (1823).

[6] 'Hist. Nat. des Cétacés' (Complément de Buffon), p. 342.

[7] 'Synopsis Mammalium,' p. 524 (1829).

In the great revision of the nomenclature of the Cetacea undertaken by Dr. Gray in the Zoology of the Voyage of the 'Erebus' and 'Terror' (1846), Rudolphi's Whale was called *Balænoptera laticeps*, an ill-chosen name, as the head is not wider proportionally than in other members of the genus. In Dr. Gray's next revision [1], the genus *Balænoptera* being divided into three, it appears as *Sibbaldius laticeps*, under which name I described the skeletons referred to above in the P. Z. S. for 1864. A still further subdivision of the genera of Whales by Dr. Gray in 1871 [2] resulted in the synonym of *Rudolphius laticeps*.

Lesson's specific name *borealis*, whether regarded as original or as a translation of Cuvier's designation, has undoubted priority, and has moreover received the sanction of Van Beneden and Gervais, being used in their magnificent work on the osteology of the Cetacea. It has also been adopted by P. Fischer in his valuable memoir on the Cetacea of the south-west of France [3].

The generic name is of course of much less importance, depending entirely upon whether it is considered expedient to retain Lacépède's genus *Balænoptera* in its integrity for all the Rorquals, or whether any of the subdivisions proposed by Dr. Gray should be adopted. Although these, especially in the later revisions, became far too numerous to be considered of generic value, being founded in many cases on mere individual variation, or on characters depending on immaturity (as *Benedenia*), there is perhaps something to be said for the original triple division into *Physalus*, *Sibbaldius*, and *Balænoptera*, which certainly represent three distinct sections of the group, characterized by osteological differences, described in my "Notes on the Whales in the Museums of Holland and Belgium," P. Z. S. 1864. As, however, we have still so much to learn of the Rorquals of other seas, and as the possibility of intermediate forms being discovered is not yet exhausted, I think it better for the present at least to retain the old generic designation for them all.

3. Additional Observations on the Structure of the Female Organs of the Indian Elephant (*Elephas indicus*). By M. Watson, M.D., Professor of Anatomy in the Owens College, Manchester.

[Received July 19, 1883.]

In a previous communication to this Society [4] I directed attention to the diversity of statement on the part of anatomists with regard to the structure of the female organs of the Indian Elephant. In

[1] P. Z. S. 1864, p. 399.

[2] 'Suppl. Cat. Seals and Whales in Brit. Mus.' p. 54 (1871).

[3] Fischer cites the species as *B. borealis*, Cuvier, following the practice usual with French authors in the numerous cases in which Cuvier described species under a vernacular appellation without bestowing upon them any systematic Latin name.

[4] Trans. Zool. Soc. 1881, p. 111.

that communication I pointed out that, while in the majority of specimens which had been examined a well-developed septum uteri existed, yet this septum varied in length in different specimens, and that in none, with the single exception of that which formed the subject of that communication, was the septum uteri complete, but fell short of the os uteri to a greater or less extent in different individuals. In none, moreover, was there the slightest trace of a vaginal septum with the exception of the specimen described by myself, in which the septum vaginæ, like the septum uteri, was complete, and of that described by Messrs. Miall and Greenwood[1], in which the septum vaginæ was reduced to the condition of a fibrous cord, which, stretching across the orifice of the vagina, led these authors to regard it as the representative of the hymen.

Having recently, through the kindness of Mr. Harniston of Southport, had an opportunity of examining the female organs of another young Indian Elephant, I have thought it might be well, in view of the diversity of statement above referred to, to put on record the result of a careful dissection of the female organs of this specimen. I shall, for the sake of comparison with my previous communication, class my observations under four heads:—1st, the condition of the septum uteri, including its relation to the body of the uterus; 2nd, the differentiation of a secondary vagina from the uterus on the one hand, and from the urogenital canal on the other; 3rd, the condition of the vaginal septum; and 4th, the number and position of the orifices which communicate with the commencement of the urogenital canal.

With regard to the first of these points, I found that the uterus presented the form already familiar to us through the researches of earlier observers. It consisted of an elongated corpus uteri, the exact dimensions of which I could not determine, as its anterior portion had been removed before the specimen fell into my hands. Enough of the organ, however, remained to show that, so far as the *external* form of the uterus was concerned, it did not differ from the specimen which I described and figured in the Transactions of the Society. The *interior* of the uterus was provided with a well-developed septum which, although it occupied the greater portion of the uterus (dividing it into lateral compartments), nevertheless failed to reach the os uteri, but ceased two inches in front of that orifice, at which point it presented a slightly concave or semilunar margin. In this specimen therefore, as in all which have been previously described, with the single exception of that formerly examined by myself, there was a unilocular corpus uteri, which measured two inches in length, the remainder and much the greater portion of the uterus being divided into two lateral compartments by means of a septum which extended from the junction of the uterine cornua backwards to within two inches of the os uteri.

With regard to the second point, the differentiation of a secondary vagina as distinguished from the uterus on the one hand and the urogenital canal on the other, I found in the specimen under con-

[1] 'Studies in Comparative Anatomy,' vol. ii. p. 64.

sideration no difficulty in identifying this portion of the sexual canal. It was clearly recognizable externally from the uterus in front, as well as from the urogenital canal behind, by the greater thinness of its walls, while on opening it the cavity, which was of an oval form, was seen to be larger than that of the uterus, from which it was separated by a slightly puckered constriction which permitted the passage of a finger. Posteriorly the secondary vagina communicated with the urogenital canal by means of a *single* orifice which, smaller than that leading into the uterus, permitted of the insertion of an ordinary knitting-needle. This orifice was undefended by any valve. The mucous membrane of the secondary vagina, moreover, differed in character from that of the uterus, inasmuch as in the latter it was thrown into longitudinal plications, whereas in the secondary vagina the mucous membrane was uniformly smooth and devoid of rugæ. In all respects the secondary vagina of this specimen of the Indian Elephant agreed closely with the corresponding portion of the female organs of the African species as described by Perrault [1] and Forbes [2]. By Perrault the secondary vagina is described under the name of "corps ovale."

The third point to be noticed in the anatomy of the specimen under consideration was the total absence of a vaginal septum, such as I found completely developed in that which I formerly described in the Transactions of this Society. In that specimen the uterine septum was complete, and extended from the junction of the uterine cornua in front, backwards to the os uteri behind, whence it was prolonged backwards along the whole length of the vagina to the opening of the latter into the urogenital canal by means of a well-developed septum vaginæ. In the present specimen, on the contrary, the septum uteri was incomplete, and there was a total absence of the septum vaginæ, which formed so exceptional a feature in the anatomy of the specimen which I formerly examined. In this respect the specimen under consideration agrees with every one of those which have been previously examined by other anatomists with the single exception of that described by Messrs. Miall and Greenwood, in which the septum vaginæ was represented only by a fibrous cord, which, stretching across the aperture of communication between the vagina and the urogenital canal, led those authors to regard it as the representative of a hymen.

With reference to the fourth point, the number of orifices which communicate with the commencement of the urogenital canal, I found that in the specimen under consideration there were four—firstly, the orifice of the urethra, which was situated below that of the secondary vagina; secondly, the orifice of the secondary vagina which was single, and was not divided into two separate apertures by the posterior extremity of the vaginal septum, as was the case in the specimen which I formerly described, and in that figured by Messrs. Miall and Greenwood, in which that septum was reduced to

[1] 'Mémoires pour servir à l'histoire naturelle des Animaux,' tome iii. p. 132.
[2] Proc. Zool. Soc. 1879, p. 431

the condition of a fibrous cord; and thirdly, the two orifices of the canals of Gaertner, which were situated on either side of the os vaginæ, and therefore occupied the same position as in the specimen which I formerly described.

The examination of the female organs of the Indian Elephant just described shows that we have not as yet arrived at an understanding of the normal configuration of these parts, and of the variations which they manifest in different specimens of the same species. In some, as in the specimens described by Stukeley, Hunter, Mayer, Miall and Greenwood, the corpus uteri was single, and the uterine septum fell short of the mouth of the uterus; while in at least one other, that described by myself in the Transactions of this Society, the uterus was divided into two compartments by a perfect septum uteri, which extended from end to end of that organ.

In some specimens, as in those described by Stukeley[1], Hunter[2], Owen[3], Miall and Greenwood, as well as in that formerly described by myself, a secondary vagina was clearly differentiated from the uterus in front, and from the urogenital canal behind; while in at least one other, that described by Mayer, the secondary vagina was not distinguishable as a distinct structure, but apparently formed part of the uterus. In some, as in the specimen just described, as well as in those described by Mayer, Hunter, and Owen, there was not the slightest trace of a vaginal septum; in others, such as that formerly described by myself in the Transactions of this Society, the vagina was divided from end to end by a complete septum; while in that described by Miall and Greenwood, and probably in that figured by Stukeley, the vaginal septum was represented by a fibrous cord which, stretching across the mouth of the vagina, divided that orifice into two.

In some specimens, as in that just described, and in those of Mayer, Hunter, and Owen, there were four separate orifices which communicated with the commencement of the urogenital canal, namely those of the single os vaginæ, of the urethra, and of the two canals of Gaertner; while in the specimen examined on a previous occasion by myself, as well as in that examined by Miall and Greenwood, the single os vaginæ was divided into two parts by the posterior extremity of the vaginal septum.

In the last-named specimens therefore there were five apertures which communicated with the urogenital canal, namely the two ora vaginæ, the orifices of the two canals of Gaertner, and the orifice of the urethra.

Further research is necessary to enable us to explain and reconcile the variations in structure of the female organs which are met with in different specimens of the Indian Elephant; and it is to be hoped that those who have an opportunity of investigating the structure of this animal will not lose sight of the fact that much

[1] 'On the Spleen, to which is added some Anatomical Observations on the Dissection of an Elephant.' London, 1723, p. 104.

[2] 'Essays and Observations,' vol. ii. p. 175.

[3] 'Anatomy of Vertebrates,' vol. iii. p. 692.

yet remains to be done before we shall have arrived at an accurate knowledge of the entire anatomy of this animal.

Postscript. Since the foregoing pages were written, Dr. R. J. Anderson[1] has published in the 'Journal of Anatomy' a short account of the anatomy of an additional specimen of the Indian Elephant.

In this paper the author mentions the presence of a uterus, vagina, and genito-urinary passage, but communicates no particulars regarding the structure of these different parts of the female organs. Hence our knowledge of these organs and of the variations which they present in different specimens of the Indian Elephant remains in the same unsatisfactory state as before.

4. Descriptions of new Asiatic Diurnal Lepidoptera.

By F. Moore, F.Z.S., &c.

[Received September 12, 1883.]

(Plates XLVIII. & XLIX.)

Subfamily Satyrinæ.

Callerebia modesta, n. sp.

Male. Smaller than *C. nirmala*. Upperside similarly marked with smaller ocelli. Underside uniformly brown throughout both wings, the ocelli less distinctly bordered; hind wing with a well-formed small ocellus between the radial and upper median vein, in addition to that near anal angle.

Expanse $1\frac{6}{10}$ inch.

Hab. Gurhwal, N.W. Himalaya (*Capt. Beckett*). In coll. F. Moore.

Subfamily Nymphalinæ.

Enispe tessellata, n. sp.

Male and Female. Allied to *E. euthymius*: fore wing with broader marginal and submarginal bands, which are also confluent at their angles, the discal macular band composed of larger and confluent spots; there is also an inner band which runs into the upper discal streak, but which is less apparent on the hind wing; the discocellular lunular spot is also larger, the veins in crossing the disk are also black-lined: hind wing with three similar outer confluent bands, the linear inner band indistinct in the male; veins across the disk black-lined.

Expanse, ♂ $3\frac{1}{4}$, ♀ $3\frac{1}{2}$ inches.

Hab. Darjiling (*Grote*), Nepal (*Ramsay*). In coll. F. Moore.

Fam. Lycænidæ.

Gerydus drumila.

Miletus drumila, Moore, P. Z. S. 1865, p. 777, pl. 41. fig. 12, ♀.

Male. Upperside dark umber-brown: fore wing with a pale medial longitudinal fascia curving from lower end of the cell across the disk.

[1] 'Journal of Anatomy and Physiology,' vol. xvii. p. 491.